WHAT IS CLAIMED IS:

1. A method for quantifying a plurality of safe operating regions within a safe operating area (SOA) for a bipolar junction transistor (BJT), comprising:

providing a current mirror circuit with mutually coupled first and second BJTs, wherein

said first BJT includes a base electrode, a collector electrode and an emitter electrode with an area,

said second BJT includes a base electrode, a collector electrode and an emitter electrode with an area, and

said second BJT emitter area is greater than said first BJT emitter area;

applying an inter-electrode voltage with a plurality of values to first and second ones of said second BJT electrodes;

applying a first current with a plurality of values to at least one of said first BJT electrodes;

measuring a plurality of values of a second current through one of said second BJT electrodes corresponding to a plurality of combinations of said pluralities of inter-electrode voltage and first current values;

computing a plurality of electrode current densities corresponding to a plurality of ratios of said plurality of second current values and said second BJT emitter electrode area;

computing a plurality of ratios of said second and first current values corresponding to at least a portion of said plurality of combinations of said pluralities of inter-electrode voltage and first current values;

computing a plurality of ratio errors corresponding to a plurality of differences between each one of said plurality of second and first current ratios and a reference current ratio; and

generating a plurality of contours corresponding to said plurality of electrode current densities as functions of said plurality of inter-electrode voltage values for said plurality of ratio errors.

2. The method of claim 1, wherein said providing a current mirror circuit with mutually coupled first and second BJTs comprises providing first and second silicon-on-insulator BJTs.

3. The method of claim 1, wherein said applying an inter-electrode voltage with a plurality of values to first and second ones of said second BJT electrodes comprises applying said inter-electrode voltage to said second BJT collector and emitter electrodes.

4. The method of claim 1, wherein said applying a first current with a plurality of values to at least one of said first BJT electrodes comprises applying said first current to said first BJT collector electrode.

5. The method of claim 1, wherein said measuring a plurality of values of a second current through one of said second BJT electrodes corresponding to a plurality of combinations of said pluralities of inter-electrode voltage and first current values comprises measuring said plurality of values of said second current through said second BJT collector electrode.

6. The method of claim 1, wherein said computing a plurality of electrode current densities corresponding to a plurality of ratios of said plurality of second current values and said

second BJT emitter electrode area comprises computing a plurality of emitter electrode current densities for said second BJT.

7. A method for quantifying a plurality of safe operating regions within a safe operating area (SOA) for a bipolar junction transistor (BJT), comprising:

providing a plurality of transistor model data for first and second BJTs, wherein

said first BJT includes a base electrode, a collector electrode and an emitter electrode with an area,

said second BJT includes a base electrode, a collector electrode and an emitter electrode with an area, and

said second BJT emitter area is greater than said first BJT emitter area;

simulating a current mirror circuit with said plurality of transistor model data, wherein said first and second BJTs are mutually coupled;

simulating an application of an inter-electrode voltage with a plurality of values to first and second ones of said second BJT electrodes;

simulating an application of a first current with a plurality of values to at least one of said first BJT electrodes;

computing a plurality of values of a second current through one of said second BJT electrodes corresponding to a plurality of combinations of said pluralities of inter-electrode voltage and first current values;

computing a plurality of electrode current densities corresponding to a plurality of ratios of said plurality of second current values and said second BJT emitter electrode area;

computing a plurality of ratios of said second and first current values corresponding to at least a portion of said plurality of combinations of said pluralities of inter-electrode voltage and first current values;

computing a plurality of ratio errors corresponding to a plurality of differences between each one of said plurality of second and first current ratios and a reference current ratio; and

generating a plurality of contours corresponding to said plurality of electrode current densities as functions of said plurality of inter-electrode voltage values for said plurality of ratio errors.

8. The method of claim 7, wherein said providing a plurality of transistor model data for first and second BJTs comprises providing a plurality of transistor model data for first and second silicon-on-insulator BJTs.

9. The method of claim 7, wherein said simulating an application of an inter-electrode voltage with a plurality of values to first and second ones of said second BJT electrodes comprises simulating an application of said inter-electrode voltage to said second BJT collector and emitter electrodes.

10. The method of claim 7, wherein said simulating an application of a first current with a plurality of values to at least one of said first BJT electrodes comprises simulating an application of said first current to said first BJT collector electrode.

11. The method of claim 7, wherein said computing a plurality of values of a second current through one of said second BJT electrodes corresponding to a plurality of combinations of said pluralities of inter-electrode voltage and first current values comprises computing said plurality of values of said second current through said second BJT collector electrode.

12. The method of claim 7, wherein said computing a plurality of electrode current densities corresponding to a plurality of ratios of said plurality of second current values and said second BJT emitter electrode area comprises computing a plurality of emitter electrode current densities for said second BJT.